

IN THE CLAIMS:

Claims 1 - 26 (**canceled**).

1 27. (**NEW**): A method of imaging a portion of the aorta of a patient using a
2 magnetic resonance imaging system, the method comprising:
3 determining an arrival time of a test bolus in a region of interest;
4 correlating an administration of a magnetic resonance contrast agent with an
5 acquisition of magnetic resonance image data, including image data which is
6 representative of the center of k-space, using the arrival time of the test bolus;
7 administering the magnetic resonance contrast agent to the patient; and
8 acquiring the magnetic resonance image data using a 3D pulse sequence,
9 wherein the image data which is representative of the center of k-space is acquired
10 while the concentration of the contrast agent in the portion of the aorta is greater
11 than a concentration of the contrast agent in veins and background tissue adjacent
12 to the portion of the aorta.

1 28. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance
2 image data further includes using a flip angle which is greater than about 30° and
3 less than or equal to about 90°.

1 29. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance
2 image data further includes using a TR which is less than about 10 milliseconds and
3 a TE which is less than about 3 milliseconds.

1 30. **(NEW)**: The method of claim 27 wherein acquiring magnetic resonance
2 image data further includes acquiring a substantial portion of the image data which
3 is representative of the central portion of k-space while the patient suspends
4 respiration.

1 31. **(NEW)**: The method of claim 27 further including correlating the
2 acquisition of the image data which is representative of the center of k-space with
3 the suspension of respiration by the patient.

1 32. **(NEW)**: The method of claim 27 further including imaging at least one
2 renal artery of the patient by acquiring magnetic resonance image data, of a
3 coronally oriented image volume including the renal artery wherein the image data
4 being acquired while the concentration of the contrast agent in the renal artery is
5 substantially greater than a concentration of the contrast agent in veins and
6 background tissue adjacent to the artery.

1 33. **(NEW)**: The method of claim 27 further including imaging at least one
2 renal artery of the patient by acquiring magnetic resonance image data including
3 image data which is representative of the center of k-space while the concentration
4 of the contrast agent in the renal artery is substantially greater than a concentration
5 of the contrast agent in veins and background tissue adjacent to the artery.

1 34. **(NEW)**: The method of claim 34 wherein imaging at least one renal
2 artery of the patient further includes collecting 3D phase contrast images.

1 35. **(NEW)**: The method of claim 27 wherein the image volume of the 3D
2 pulse sequence includes at least one dimension which is greater than 25 cm.

1 36. **(NEW)**: The method of claim 27 further including:
2 collecting image data of a pre-contrast image data set including collecting
3 image data before administering a substantial amount of the magnetic resonance
4 contrast agent to the patient; and

5 constructing an image of the portion of the aorta by subtracting the image
6 data of the pre-contrast image data set from the image data acquired while the
7 concentration of the contrast agent in the portion of the aorta is greater than a
8 concentration of the contrast agent in veins and background tissue adjacent to the
9 portion of the aorta.

1 37. **(NEW)**: The method of claim 27 further including acquiring image data
2 of the periphery of k-space while the concentration of the contrast agent in the aorta
3 is greater than a concentration of the contrast agent in veins and background tissue
4 adjacent to the aorta.

1 38. **(NEW)**: A method of imaging an artery of a patient using a magnetic
2 resonance imaging system, the method comprising:

3 determining an arrival time of a magnetic resonance contrast agent in a
4 region of interest wherein the region of interest includes the artery;

5 correlating an injection of the magnetic resonance contrast agent to the
6 patient with a collection of magnetic resonance image data using the arrival time of
7 the magnetic resonance contrast agent in the region of interest;

8 injecting the magnetic resonance contrast agent to the patient; and

9 collecting the magnetic resonance image data using a 3D pulse sequence,
10 wherein collecting magnetic resonance image data includes collecting a substantial
11 portion of the image data while the concentration of the contrast agent in the artery
12 is greater than a concentration of the contrast agent in veins and background tissue
13 adjacent to the artery.

1 39. **(NEW)**: The method of claim 38 wherein the arrival time of the magnetic
2 resonance contrast agent is an estimated arrival time.

1 40. **(NEW)**: The method of claim 38 further including correlating collection of
2 magnetic resonance image data which is representative of the center of k-space
3 with the arrival time of the contrast agent in the region of interest.

1 41. **(NEW)**: The method of claim 38 wherein determining the arrival time of
2 a magnetic resonance contrast agent in the region of interest includes using a test
3 bolus.

1 42. **(NEW)**: The method of claim 38 further including correlating the
2 suspension of the respiration of the patient with the collecting magnetic resonance
3 image data.

1 43. **(NEW)**: The method of claim 42 wherein correlating the suspension of
2 the respiration of the patient with the collecting magnetic resonance image data
3 includes collecting a substantial portion of the image data which is representative of
4 the center of k-space while the patient suspends respiration.

1 44. **(NEW)**: The method of claim 42 wherein collecting magnetic resonance
2 image data further includes using a TR which is less than about 10 milliseconds, a
3 TE which is less than about 7 milliseconds, and a flip angle which is between about
4 30° and about 90°.

1 45. **(NEW)**: The method of claim 38 further including imaging at least one
2 renal artery of the patient by collecting image data which is representative of the
3 center of k-space while the concentration of the contrast agent in the renal artery is
4 greater than a concentration of the contrast agent in veins and background tissue
5 adjacent to the artery.

1 46. **(NEW)**: The method of claim 38 wherein collecting magnetic resonance
2 image data further includes using a slice thickness which is less than about 4
3 millimeters and the image volume of the 3D pulse sequence includes at least one
4 dimension which is at least about 25 centimeters.

1 47. **(NEW)**: The method of claim 38 wherein collecting magnetic resonance
2 image data further includes collecting image data of the periphery of k-space while

3 the concentration of the contrast agent in the artery is greater than a concentration
4 of the contrast agent in veins and background tissue adjacent to the artery.

1 48. **(NEW)**: The method of claim 38 wherein determining the arrival time of
2 a magnetic resonance contrast agent in the region of interest includes estimating the
3 arrival time based on the physical condition of the patient or the location of the artery
4 in the patient.

1 49. **(NEW)**: A method of imaging an artery of a patient using a magnetic
2 resonance imaging system, the method comprising:

3 calculating an arrival time of the contrast agent in the region of interest;

4 injecting a magnetic resonance contrast agent to the patient;

5 correlating collection of magnetic resonance image data which is
6 representative of the center of k-space with the injection of the magnetic resonance
7 contrast agent using the arrival time of the contrast agent in the region of interest;

8 collecting magnetic resonance image data, including the image data which is
9 representative of the center of k-space, using a 3D pulse sequence, wherein at least
10 a portion of the image data is collected while the concentration of the contrast in the
11 artery is greater than a concentration of the contrast agent in veins and background
12 tissue adjacent to the artery.

1 50. **(NEW)**: The method of claim 49 wherein calculating the arrival time of
2 the contrast agent in a region of interest includes using a test bolus.

1 51. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance
2 image data includes collecting a substantial portion of the image data while the
3 patient suspends respiration.

1 52. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance
2 image data further includes using a TR which is less than about 10 milliseconds.

1 53. **(NEW)**: The method of claim 49 further including imaging at least one
2 renal artery of the patient by collecting magnetic resonance image data using a 3D
3 pulse sequence, the image data being collected while the concentration of the
4 contrast agent in the renal artery is greater than a concentration of the contrast
5 agent in veins and background tissue adjacent to the renal artery.

1 54. **(NEW)**: The method of claim 49 wherein calculating the arrival time of a
2 magnetic resonance contrast agent in the region of interest includes calculating the
3 arrival time based on the physical condition or age of the patient.

1 55. **(NEW)**: The method of claim 49 further including instructing the patient
2 to suspend respiration while collecting the magnetic resonance image data which is
3 representative of the center of k-space.

1 56. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance
2 image data includes collecting image data which is representative of the periphery of
3 k-space immediately after collecting image data which is representative of the center
4 of k-space.